Interdisciplinary Instrumentation Colloquium

Electronics in the Polar Ice – The Engineering Challenges of the IceCube Optical Modules

Speaker: John Joseph
Engineering Division, LBNL

Date: Wednesday, April 5, 2006
Time: 4:00 PM sharp
Place: LBNL, Building 50 Auditorium
(directions at http://InstrumentationColloquium.LBL.gov)

IceCube is an array of light-sensitive detectors that utilizes a cubic kilometer of clear ice at the South Pole as a medium to measure interactions of high-energy neutrinos. A total of 4000 photodetectors will be embedded in the ice to detect the spatial distribution of the light emitted along particle tracks and reconstruct the events. IceCube is opening a new window on the universe and will be used to map the neutrino sky. The detector modules are situated 1500 and 2500 meters below the surface. Once in the ice, they must operate reliably for at least 15 years and will not be accessible for maintenance. The concept of the electronics that acquire the signal, process it, and send it to the surface originated at LBNL. This presentation will address the many engineering challenges we overcame to produce a low noise, mixed analog-digital design that would meet the high reliability and performance requirements of the experiment.

Presentations (pdf files) and dates of future colloquia are posted at
http://InstrumentationColloquium.LBL.gov

Suggestions for speakers and topics are welcome. Please contact
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